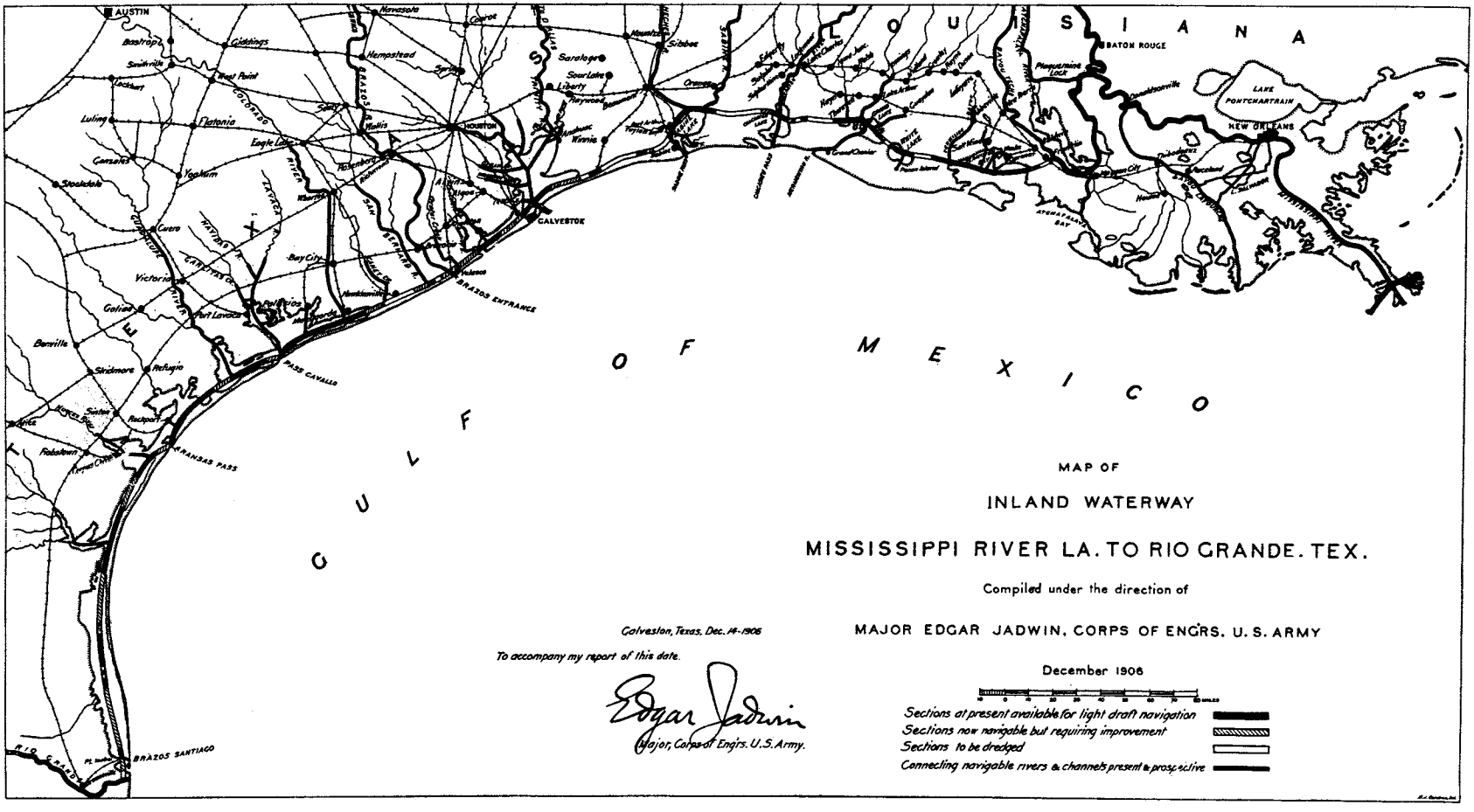


Status of the inland waterway, 1906

6

Navigable Waterways: A Continuing Responsibility

The Great Connection

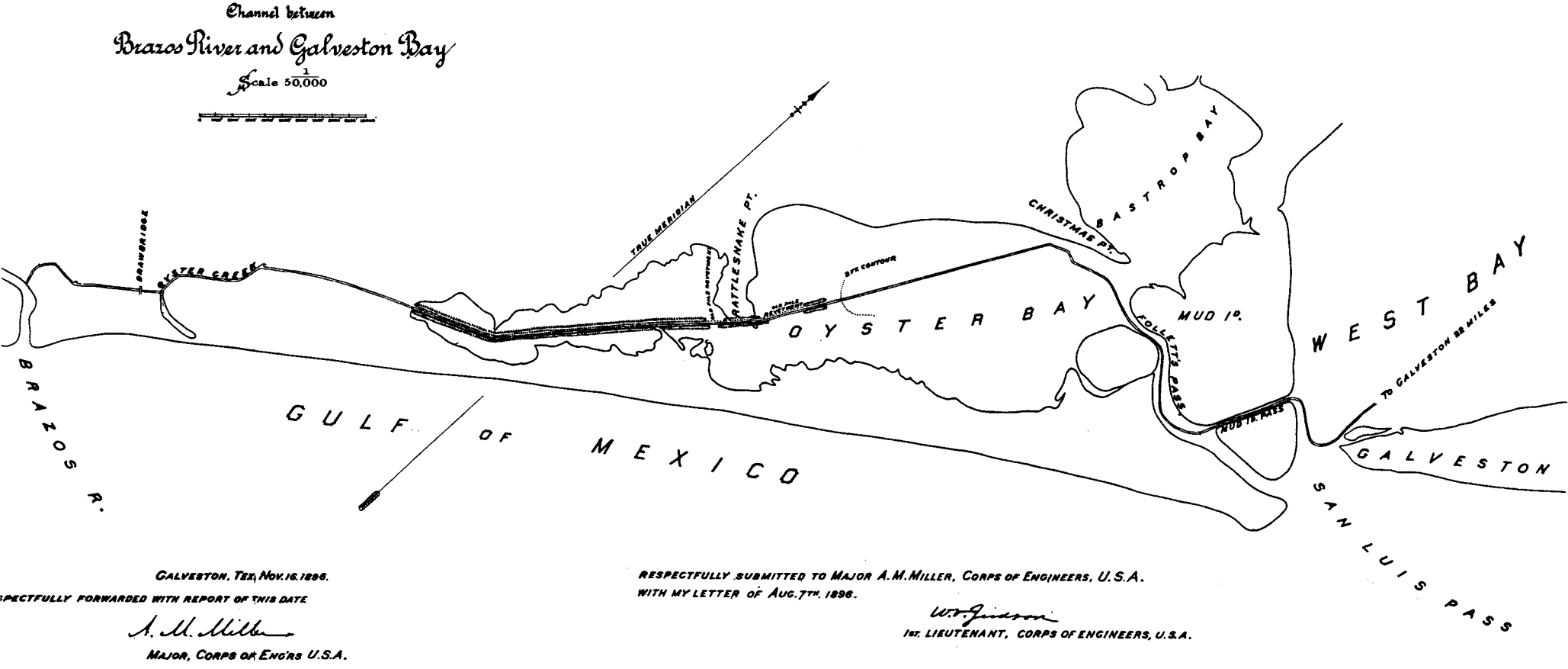
The advantages afforded by inland waterways were appreciated by the earliest settlers in America. As vital arteries supporting transportation, the streams, rivers, bayous, lakes, and other natural water routes promoted primitive settlement and eventually urban development. They also gave rise to a type of water transportation different from that conducted at deep-water ports. Their shallow, sheltered waters provided safe passage to barges and other light-draft vessels that could not withstand the battering of the open seas, but could be depended upon to link the scattered coastal communities and to penetrate the interior of the country, creating a commercial connection between geographically isolated points.

The canal craze was at its height when the Corps of Engineers first entered the realm of civil works. The vision of a vast network of protected waterways had captured the imaginations of influential men. In 1826, Congress appropriated $20,000 and authorized a survey for a canal route between the Atlantic and Gulf of Mexico.[1] Thus were sown the first seeds for an intracoastal project that would be in the making for more than a century and would exceed in scope even the extravagant projections of that day. The concept of joining the young nation together by inland navigation began translation into practical canal projects at a time when the Mexican flag flew over Texas, roughly twenty years before Texas was admitted to the Union.

The Texas Gulf Coast was not considered in this grandiose scheme until 1873 when Congress authorized a survey:

> For connecting the inland waters along the margin of the Gulf of Mexico, from Donaldsonville, in Louisiana, to the Rio Grande river, in Texas, by cuts and canals, not to exceed twenty thousand dollars . . . .[2]

From his post in New Orleans, Captain Howell delegated the field chores to three civilian engineers. The Louisiana segment was divided between



First channel between Brazos River and Galveston Bay included 11-mile canal of the Galveston and Brazos Navigation Company, excavated through waters of Oyster Bay and the mainland, and utilizing the bed and waters of Oyster Creek. Constructed in 1850, the navigation company's canal varied in depth from 2 to 7 feet in 1896.

J. A. Hayward, who worked west from the Mississippi River, and H. C. Ripley, who worked east from Sabine Lake. Assistant Engineer James S. Polhemus was assigned the formidable task of surveying the entire Texas Coast. With a party of three men, he ran his transit-line a distance of 50 miles from East Galveston Bay to Sabine Lake between January 28 and April 1, 1873. Characterized by an average elevation of 2 feet, this territory led them through marshy swamplands, infested with "clouds of mosquitoes" and covered with "a dense growth of sea-cane."[3]

The remainder of the Texas Coast, from West Galveston Bay to the Rio Grande, was surveyed between November 20, 1873 and August 1, 1874. Accompanied by one assistant and four men, Polhemus measured 242 miles as the "almost impenetrable swamps" gradually gave way to "wide and shallow bays, along a wild and almost uninhabited coast."[4]

Two stretches along their route had been altered by man about twenty years earlier. The Galveston and Brazos Canal, connecting the waters of West Galveston Bay and the Brazos River, remained navigable with depths ranging from 3 to 6 feet. Further down the coast, a stream known as Caney Creek, which at one time emptied into the Gulf, had been rechanneled into Matagorda Bay by a 2,850-foot-long ditch. The outlet to the Gulf disappeared and the small ditch gradually enlarged to dimensions of 15 by 80 feet, earning for itself the name of "The Big Canal." Polhemus and his party also traversed several "cuts" connecting bays along the 77 miles between Indianola and Corpus Christi.[5]

Howell based his survey report upon the fieldwork of these "young gentlemen" whom he acknowledged as having "suffered hardships rarely met in the line of their profession." He explained the guiding principle in selecting the route for the proposed 6-by-60-foot canal:

> . . . to utilize the navigable bayous, lakes, bays, and sounds or lagoons, near the coast, and make the cuts connecting them along the shortest lines available.[6]

In his report, dated 1875, Howell presented the first plan for an inland waterway beginning at the Mississippi River and terminating at the Rio Grande, where a lock with a double gate and 5-foot lift was deemed necessary.

As so often characterized his luck, Howell had the misfortune to be ahead of his time! His report was relegated to the shelf for the next thirty years; even more time would pass before commerce along the Texas Coast would justify implementation of such a sweeping plan. Meanwhile, growth of the inland waterway progressed in sporadic and piecemeal fashion, geared to the needs of specific locales as they arose.

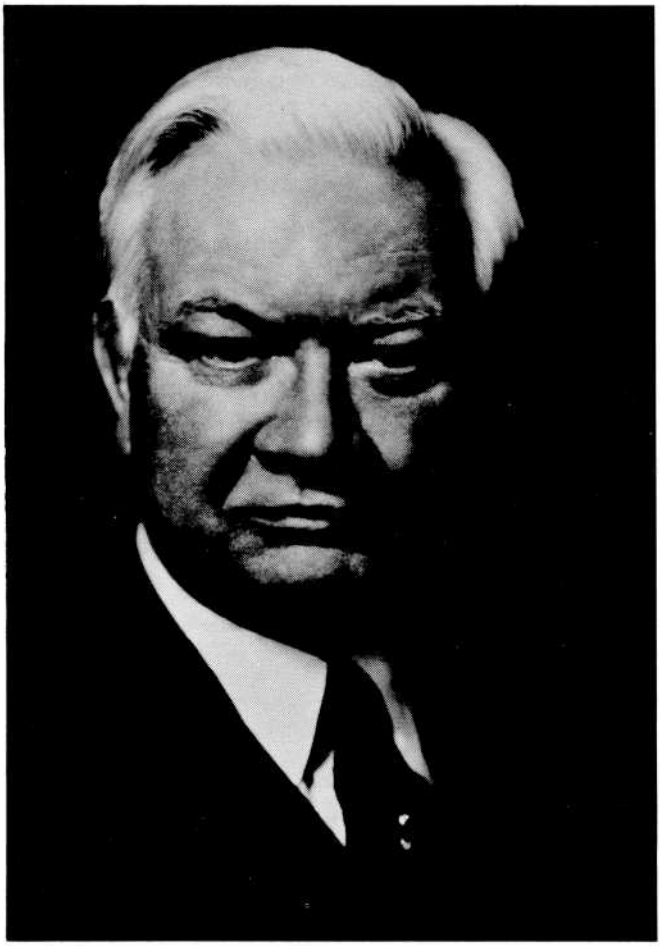
First Texas Segment

In Texas, the first segment improved by army engineers lay in West Galveston Bay. The state had dredged a channel 5 feet deep across obstructing reefs in 1859, but this passage had deteriorated drastically after the cyclone of 1875 and sustained still more damage from a severe storm in 1886. In 1892, Congress authorized a project for enlarging and straightening the channel to afford depths of 3 to 3½ feet and widths of 100 to 200 feet. Dredging was begun under contract on January 19, 1893, and completed October 2, 1895. The improvement terminated at Christmas (also called Christian's) Point in Oyster (also called Christmas) Bay.[7]

Next, attention shifted immediately southwestward to the canal of the Galveston and Brazos Navigation Company. This 11-mile-long stretch represented the only obstruction to a federally improved, continuous channel between Galveston and the Brazos River. Tolls levied on the river steamboats carrying cotton to market, fishing schooners, and other small craft using the canal made it ineligible for improvement by the federal government. Recognizing the value of this route as an alternative to the troublesome bar at the mouth of the Brazos River, Major Ernst had raised the possibility of acquiring the canal in 1887. Nine years later, Maj. A. M. Miller recommended making this purchase. On February 11, 1897, the navigation company offered the canal to the government for $50,000. Congress authorized the purchase at $30,000 and the transaction was completed in December, 1902. Meanwhile, the year 1900 saw reports of surveys and examinations of certain "adjacent streams" — Caney Creek, the San Bernard River, and Oyster Creek — with a view toward incorporating them into a network of protected waterways.[8]

Gradually, but firmly, the idea of an inland navigation system was taking hold. The fragmentation that characterized the progress to that time frustrated incipient economic development along the Gulf Coast. A young banker in Victoria, Clarence S. E. Holland, called a convention that gave birth to the Interstate Inland Waterway League on August 8, 1905. This organization pledged itself to the goal of a continuous system that would tie together the 18,000 miles of navigable waters extending from the Great Lakes, through the Mississippi Valley, and along the Louisiana and Texas coastlines.[9]

Spearheading the new league's program was a vigorous young newspaperman who had come to South Texas the year before, expressly to publicize the attractions of the new community at Kingsville in his capacity as advertising agent for the St. Louis, Brownsville & Mexico Railway.[10] Roy Miller provided capable leadership and devoted himself to



Roy Miller
(Courtesy of Dale Miller)

the intracoastal canal organization over the remaining forty years of his life. A persuasive advocate of the canal in particular and of navigation in Texas in general, he was later instrumental in obtaining appropriations for the deep-water port at Corpus Christi.

The league grew into the Intracoastal Waterway League of Louisiana and Texas, then changed its name to the Intracoastal Canal Association of Louisiana and Texas, and eventually became the Gulf Intracoastal Canal Association as it is known today. From camping on the doorstep of the nation's Capitol to prodding sluggish county governments, encouraging the donation of necessary rights-of-way and the rebuilding of bridges, this association has adhered to its purpose of promoting and insuring the success of the intracoastal canal.

Only a few months before the enthusiastic convention in Victoria, Congress had once again decided to take a comprehensive look at the "inland waterway" from the Rio Grande to the Mississippi River. Maj. Edgar Jadwin conducted the preliminary examination which, in great

measure, retraced the steps of the 1873 survey; Jadwin found a considerable portion of Howell's report still applicable. Jadwin's study, in 1905-06, included two additional surveys: one, from Aransas Pass through Turtle Cove to Corpus Christi, and the other, from Aransas Pass to and up the Guadalupe River.[11]

The Interstate Inland Waterway League clamored for a channel 9 feet deep to match navigational features on the Mississippi and Ohio valley systems. Acknowledging that a channel this deep might later be required, Jadwin based his project more conservatively on dimensions 5 feet deep and 40 feet wide. He further advised that the southwestern extremity from Corpus Christi to Point Isabel be reconsidered at a future date. The resulting legislation was again fragmented, however, providing only for channels from Corpus Christi to Aransas Pass, Aransas Pass to Pass Cavallo, and another from the Brazos River to West Galveston Bay, all dredged by 1909. Also, the authorization included a tributary channel up the Guadalupe River to Victoria.[12]

National Policy Lends a Hand

During these years, President Theodore Roosevelt, disappointed with progress on the inland transportation system, began calling for more dynamic federal action to improve the nation's natural highways.[13] In 1908, reexamination of Jadwin's report focused on the unimproved segment between the Brazos River and Matagorda Bay. This review produced a statement by Gulf Division Engineer Col. Lansing H. Beach which seems to reflect a shift toward a more liberal approach:

> Even should local conditions not be such as to demand the improvement of this portion of the inland waterways, it is believed that the fact that it is one link in the chain of waterways paralleling the shore of the gulf is of sufficient importance to cause the improvement to be made at as early a date as possible.[14]

Congress authorized improvement of this segment in 1910, thereby clearing the way for an uninterrupted channel from Galveston to Corpus Christi. Meanwhile, the more embracing national policy was explicitly underscored by the rivers and harbors act of 1909, which ordered surveys for a "continuous waterway" of enormous magnitude — from Boston to the Rio Grande.[15]

Some years later, ever seeking to advance the waterway, leaders of the intracoastal canal association approached Maj. Gen. George W. Goethals,

Maj. Gen. George W. Goethals (National Archives)

the retired army engineer credited with building the Panama Canal. They asked him to recommend some bright young engineer to study the commercial potential of a continuous canal through Louisiana and Texas. When Goethals met with canal association officials the next morning, he declared, "I believe I will take that job myself." In his report, dated November 27, 1923, Goethals estimated that the "present tonnage possibilities of such a waterway are between 5 million and 7 million tons annually, and this statement is conservative."[16] Just how conservative, the years ahead would show!

Two major breakthroughs for the Texas portion of the waterway emerged from Goethals's figures and the subsequent recommendations made by Gulf Division Engineer Col. G. M. Hoffman and Chief of Engineers Gen. Lansing H. Beach in 1924. Incorporation of the segment between the Sabine River and Galveston Bay, authorized in 1925 and completed in 1934, united the Louisiana and Texas portions of the waterway; authorization in 1927 further extended continuous inland navigation

along the Texas Coast, from its eastern border to Corpus Christi. Also, the time had come, as Jadwin predicted, to consider enlargement. Plans for the new Sabine-to-Galveston segment specified a channel 9 feet deep and 100 feet wide, in keeping with eastern and northern channels. In 1927, Congress authorized these larger project dimensions further down the coast.[17]

Another development at this time carried profound implications for the route of the future Texas intracoastal canal. In proposing the course of the channel from Sabine to Galveston, Colonel Hoffman departed from the earlier principle of dredging through the open bays. He defended the notion of a landlocked channel, to run along and inside the shoreline, stating:

> This route while a little longer and requiring more excavation will cost less for maintenance than other routes previously

Final stages of construction on Sabine River-to-Galveston Bay segment of intracoastal waterway near High Island, April 24, 1934 (Photograph by U.S. Army – Air Corps)

> proposed through the bays . . . . Experience has demonstrated the difficulty and cost of maintaining the entrance of a canal into a large bay, especially where this entrance lies across the normal currents of the bay . . . . Boats using this route will be less exposed to storm conditions in the open bay . . . .[18]

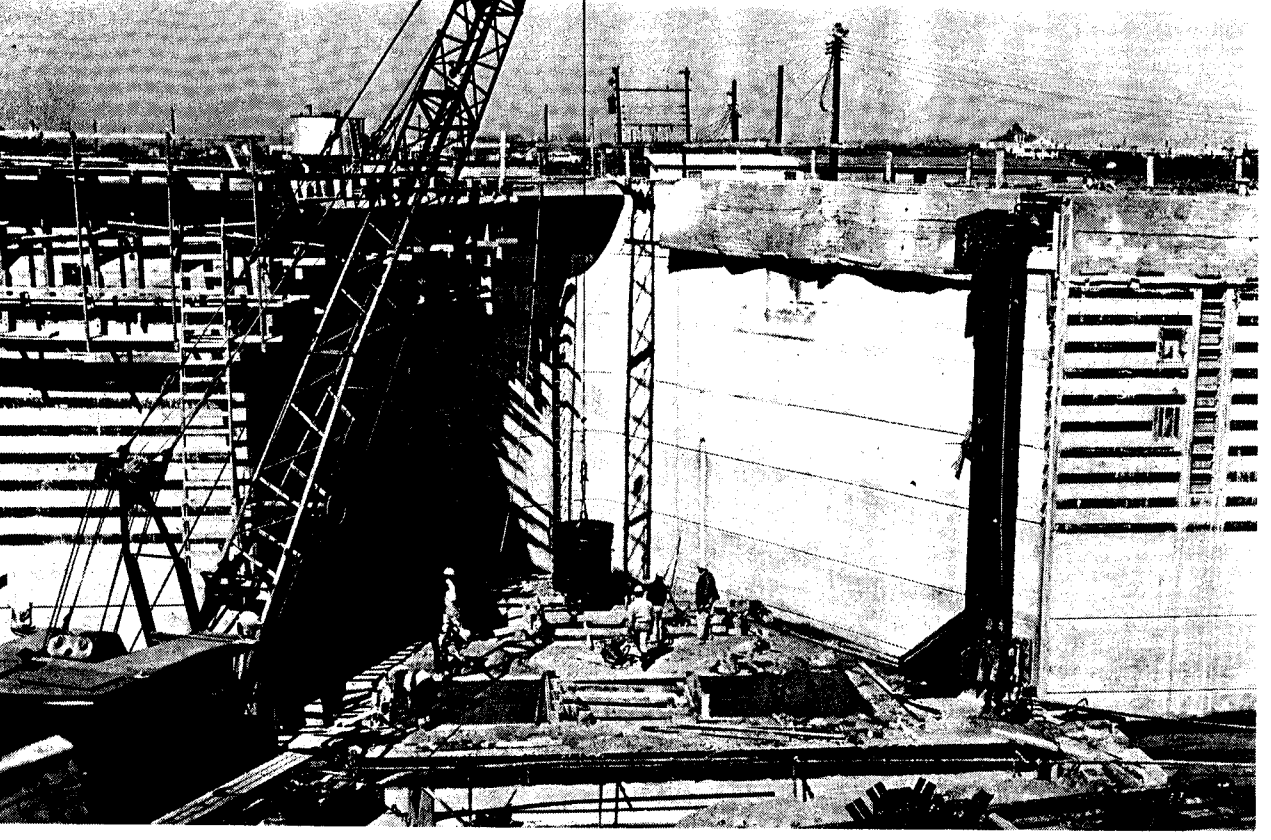
This change in philosophy led to the eventual relocation of many older channels as the project for the 9-foot channel terminating at Corpus Christi was pushed forward to completion in 1942.[19]

As work on the main channel progressed, the desirability of constructing certain tributary channels became apparent. Branch channels by which cargoes could travel directly to terminals further inland would enhance the advantages afforded by the growing intracoastal waterway. In 1938, Congress authorized feeder channels up the San Bernard and Colorado rivers plus channels to Palacios, Rockport, and the town of Aransas Pass. By that time, the nature of the commerce evidenced considerable change. Petroleum, petroleum products, iron, and steel constituted the bulk of the traffic, displacing the agricultural commodities for which the canal had been envisioned originally.[20]

The spirit of the frontier prevailed on the San Bernard River for some time after the tributary channel had been completed. Occasionally, towboats moving too quickly or carelessly along the channel would scrape the banks with the barges they pulled. Viewing this as a threat to their property, individual property owners along the channel resorted to stationing themselves on the banks, armed with rifles, to keep the towboat captains in line. Several incidents occurred in which the irate landowners literally took potshots at the recalcitrant navigators.

The 9-foot project, authorized in the middle 1920s, provided for construction of locks or guard locks where necessary. Two Texas rivers of sufficient magnitude to cause problems intersected the waterway. At the Brazos and Colorado river crossings, the intracoastal waterway was subjected to large intrusions of sediment that washed down the rivers during periods of high discharge, and to excessive currents when the river stages rose. Funds for the necessary protective structures did not become available until the 1942 fiscal year. The Brazos River floodgates were completed in September, 1943, followed within the next year by the Colorado River floodgates, which were placed in operation in August, 1944.[21]

Next, studies were conducted to determine the advisability of converting the floodgates into locks. At the Brazos River crossing, the velocity of the river flowing toward the Gulf posed the major threat to navigation.



Constructing Colorado River locks

But while these currents often caused restrictions to be placed on traffic at this point, the Brazos floodgates did not require as frequent or as prolonged closure as did those at the Colorado River.

For many years, the Colorado River had been plagued by an enormous log raft, about 25 miles long, in the vicinity of Bay City. Between 1925 and 1929, Matagorda and Wharton counties broke up this obstruction to obtain relief from severe flooding upstream. River currents carried debris from the raft downstream where it soon formed a massive delta in Matagorda Bay and created a new flood hazard to the lands adjacent to the intracoastal waterway. To alleviate this problem, in the mid-1930s, the Matagorda County Conservation and Reclamation District No. 1 dredged a channel across the bay and across Matagorda Peninsula, furnishing the river an outlet to the Gulf about 7 miles away. Maintenance of this channel as a flood discharge channel was incorporated into the intracoastal canal project in 1937; however, this channel did not offer a definitive solution to the problems created by the Colorado River. When floods swelled the river, its flow still remained partially confined and the water level in the river would rise as much as 12 feet above mean low tide at its crossing with the canal. Because of this troublesome head differential, the Corps of Engineers concluded that lock structures at the Colorado River must become essential features of any plan to minimize delays to navigation on the waterway. Conversion of the floodgates into locks was undertaken early in the 1950s and completed by 1957.[22]

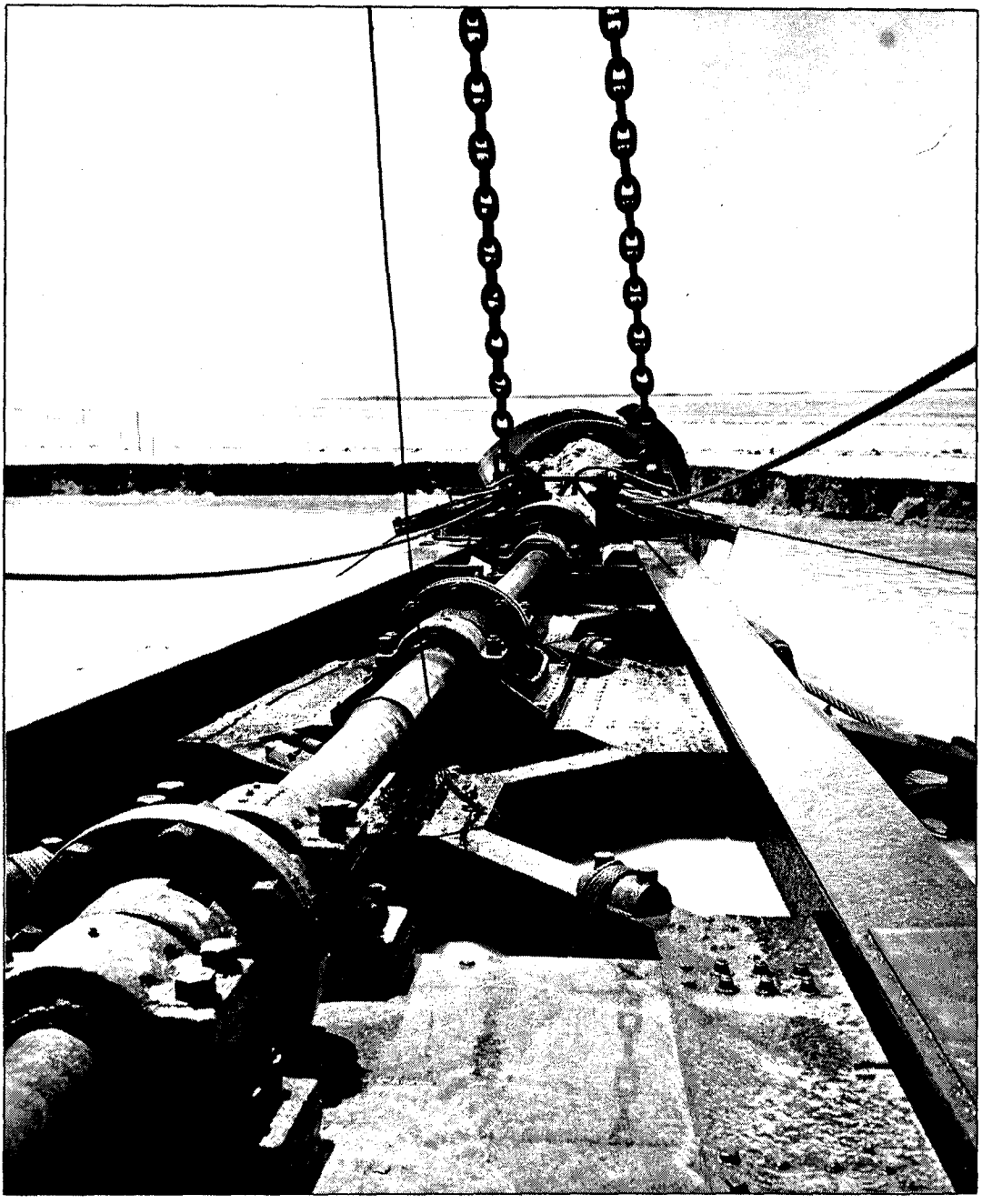
The Last Link

Exigencies of wartime hastened the next significant step in the growth of the intracoastal waterway. On July 23, 1942, motivated to promote national defense and recognizing the value of an inland system that would afford protected and prompt passage for defense materials and supplies, Congress passed legislation providing for enlarging the waterway to dimensions of 12 by 125 feet and extending it from its eastern terminus at Apalachee Bay in Florida to "the vicinity of the Mexican border."[23] The existing inland waterway amply proved its usefulness during World War II. While German submarines prowled in the Gulf of Mexico, an additional 3 million tons annually moved along the protected waterway.

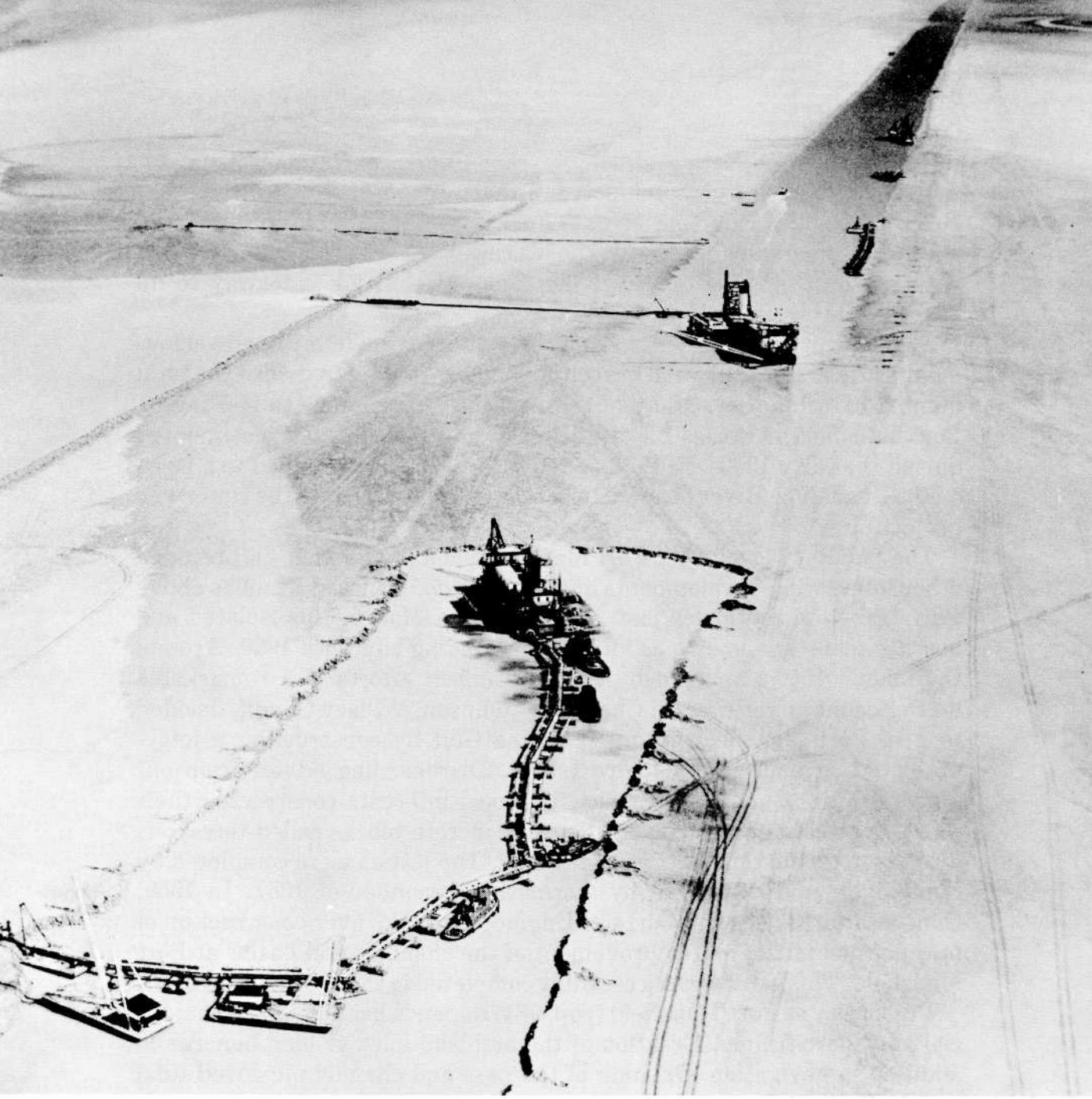
The final segment in the intracoastal waterway was charted through the Laguna Madre, a 150-mile-long, shallow body of water paralleling the coast from Corpus Christi to Brazos Santiago Pass. Separated from the Gulf by Padre Island, the Laguna Madre itself forms two natural bays that are divided in the middle by an area of mud flats. It was while surveying this area in the early 1930s that Homer Sisson, who later became area engineer at Corpus Christi, acquired an unsought epithet.

Sisson conducted one survey party south from Corpus Christi, while William Rettiger led another party north from Port Isabel. Since the extreme desolation of the region assigned to Sisson afforded no civilized alternatives, his crew camped in tents along the way. Part of the mud flats area through which they worked passed along the Kenedy Ranch. Strictly designated as a wild game preserve, the ranch abounded with deer and turkeys. Although survey party members had been expressly forbidden to enter this property carrying firearms, two of Sisson's men apparently found the temptation irresistible. As the story goes, they shot two turkeys and then lingered in the preserve area to glory in their conquests by photographing each other with the spoils. Caught red-handed by the ranch foreman, they were brought before the local judge, charged with something like six counts each, and fined accordingly. The episode did not serve to further efforts by the Corps to secure rights of entry through the mud flats and, in fact, caused so much consternation in the district offices that Harry Sinclair, the chief clerk, bestowed upon Sisson the nickname of "Turkey."[24]

Dredging of the extension from Corpus Christi to Port Isabel did not begin until enlargement of the existing waterway had been accomplished to Corpus Christi. Dredging operations began on December 12, 1945. Pipeline dredges started from both Corpus Christi and Port Isabel, working towards a meeting that would join the two sections of the Laguna Madre and mark the completion of an undertaking far more vast.



Dredging through mud flats of Laguna Madre. Cutterhead blades of dredge Miami *break up the mud. This material is then sucked through a pipe and pumped to disposal area.*



Completion of main channel connecting Mississippi River and Rio Grande. Dredge Miami, *at left, moves south to meet dredge* Caribbean, *1949.*

At the remote mud flats, the McWilliams dredge *Caribbean* moved north to meet the Standard Dredging Corporation dredge *Miami*. The final cut was made and the channel was opened on the afternoon of June 18, 1949. Dignitaries and officials arrived by boat from Corpus Christi and Brownsville to attend ceremonies celebrating the historic occasion. A civic leader from Victoria had been given the official duty of executing the

traditional ribbon-cutting ritual. As this elderly gentleman struggled with the implement on hand, scissors that proved unequal to the task, Brownsville Area Engineer Thomas Forman whipped out his pocket knife and severed the ribbon, allowing the waiting tugboats to continue through with the first cargoes to travel the completed inland waterway to its Brownsville terminus.[25]

Subsequent improvements along the waterway have involved various modifications and additional branch channels, bringing to twelve the total number of tributaries. Many of these, including channels to Harlingen, Port Mansfield, Aransas Pass, Rockport, and Palacios, were completed during the early 1950s. In 1952, a new lateral channel dredged to a point on the Guadalupe River near Victoria was incorporated into the waterway project.

The tributary channel at Port Mansfield, completed in 1949, preceded other interesting developments at that location. Situated 38 miles above Port Isabel on the lower part of the Laguna Madre, this isolated and obscure point was known as "Red Fish Landing" up until 1950. Around the middle 1950s, spurred by the determined efforts of a remarkable former county judge named Charles R. Johnson, Willacy County decided to give Port Mansfield an outlet to the Gulf by constructing a jetty-protected channel across Padre Island. Disregarding advice from engineers in the Galveston District, the local interests constructed their jetty by placing geometrically shaped, concrete blocks called tetrapods directly upon the sand bottom in the Gulf. The jetties were completed by September, and destroyed by storms in November of 1957. In 1959, Congress authorized the Corps of Engineers to take over construction of new parallel jetties and improvement of the channels and basins at Port Mansfield. This work was successfully completed in the 1962 fiscal year.[26]

Prosperity at Port Mansfield (pop. 731) depends heavily upon commercial and sport fishing. Creation of the artificial inlet yielded benefits in addition to navigation. Opening of the pass and channel improved tidal exchange, reducing salinity in the bay and thereby enhancing the environment as a support to marine life. Resulting ecological changes in the adjacent bay area have nurtured more abundant populations of redfish, brown shrimp, flounder, and spotted trout, as well as other saltwater species.[27]

Stretching from the west coast of Florida to the western extremity of the Texas Coast, the Gulf Intracoastal Waterway is referred to as the 1,000-mile miracle. Within Texas, the Galveston District maintains the 423 miles of main channel and 141 miles of tributary channels. Since this waterway opened in 1949, traffic has risen steadily and commerce has increased dramatically. Figures for tonnage handled by ports and moved

Port Mansfield jetties. Channel transects Padre Island.

on the Texas portion alone have soared as high as almost 69 million tons a year, a spectacular statistic in the light of the 12 million estimated by Goethals for the combined Texas-Louisiana system.[28]

From Mudshell to Metal

As the Gulf Intracoastal Waterway tied together the many deep-draft ports along the Texas Coast, one more pass awaited improvement. Among the first to be used for navigation, Pass Cavallo at the entrance into Matagorda Bay was the last to be successfully improved. Nevertheless, it supported considerable traffic long before establishment of the Galveston District.

The French explorer René-Robert Cavelier, sieur de La Salle, landed on the western shore of Matagorda Bay near Indianola around the year 1685. He had set sail for the mouth of the Mississippi, intending to settle and build fortifications there, but his miscalculations overshot his proposed destination by 500 miles. He claimed the land in the name of France, but continued his futile search for the Mississippi until his death a couple of years later.

The first survey at Matagorda was reported early in 1853 by Lt. George B. McClellan who stated that, although Pass Cavallo had the best bar after Galveston,

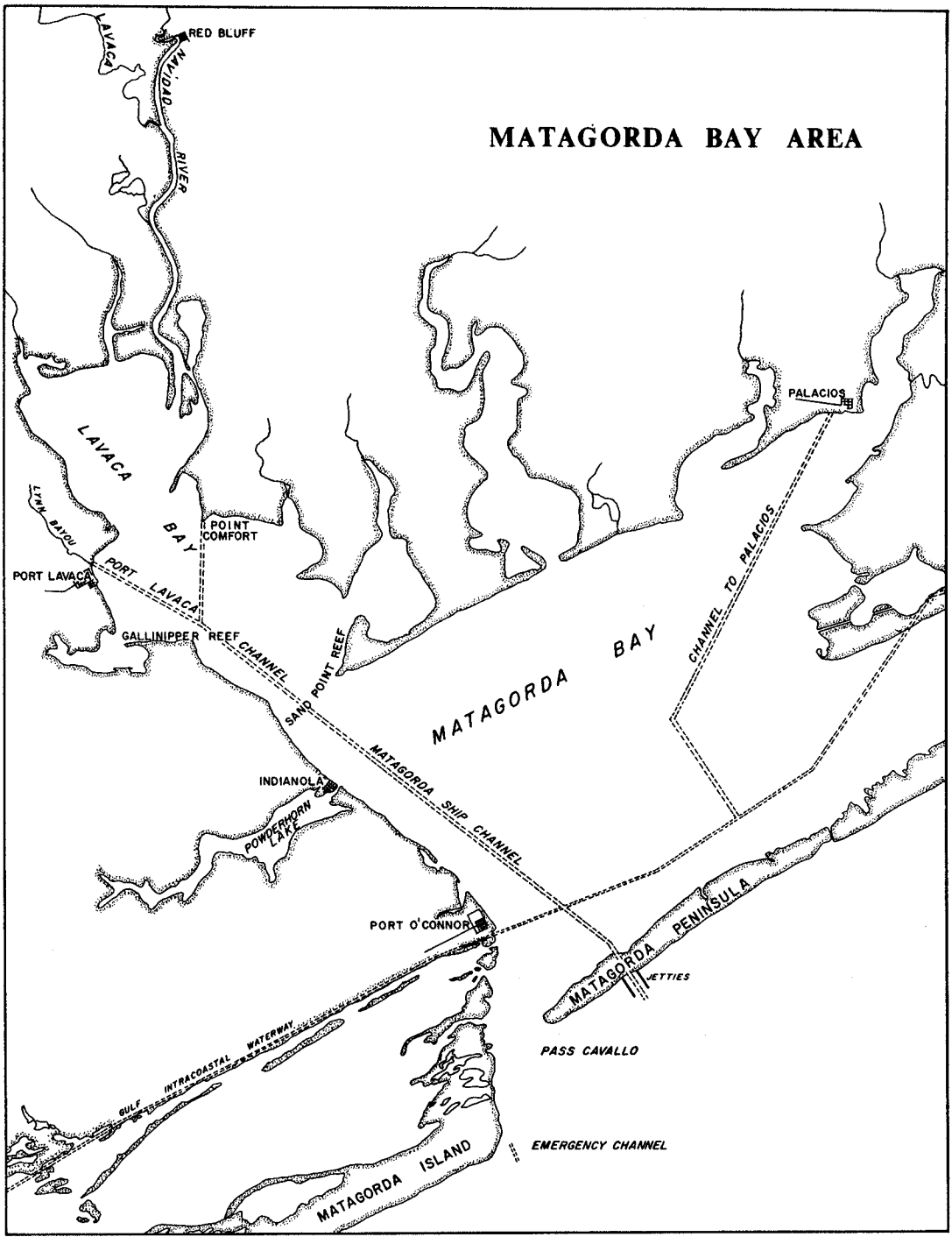
> Were anything attempted . . . it would involve the revetement [sic] of about four miles of shore and the construction of more than five miles of dike.

Emphasizing his lack of enthusiasm for improvement at this pass, he declared:

> As far as regards the "twenty-foot" channel expected to be obtained, one of one hundred feet might be looked for with equal confidence.[29]

During the mid-nineteenth century, the harbor at Indianola flourished, welcoming Morgan Line steamers and other vessels; by 1870, the town had a population of 1,900. The awful storm of 1875 submerged and swept away the town, with great loss of life. In 1880, Indianola had only 931 residents.[30]

Unaware that a second storm in 1886 would irrevocably complete the destruction of the once thriving port at Indianola, a board of engineers proposed a plan for improvement at the pass in 1879. To secure a 12-foot channel depth across the bar, a single jetty was begun by Major Mansfield in 1881 at the south side of the pass, designed to extend 7,600 feet from Matagorda Island. Construction proceeded over the next five years, marked by the usual problems of inadequate funds and work suspensions; despite Mansfield's sanguine appraisals of the jetty's effect, in 1887 after



Major Ernst had taken over the reins of the district and surveyed the jetty, he pronounced it a failure, adding,

> The improvement of this entrance is the most uncertain and difficult undertaking that has been projected upon the Texas coast.[31]

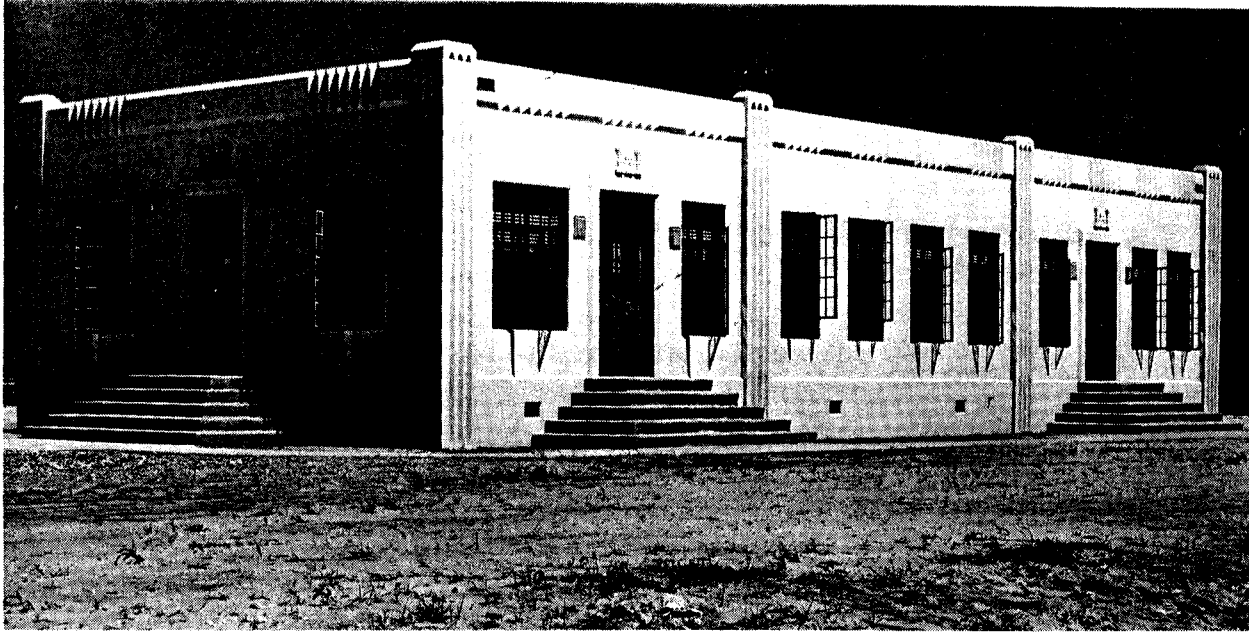
Sufficient funds for an effective improvement were not available, commercial activity on Matagorda Bay was at a low ebb, and the attempt to improve Pass Cavallo was abandoned.

For about twenty years, settlement and commerce on the shores of Matagorda Bay failed to justify navigational improvements by the federal government. Activity picked up in the adjacent territory after 1905, however, with a shift from the predominant cattle ranching to increased agricultural production of cotton and rice. On Lavaca Bay, the town of Port Lavaca had grown to include a population of two thousand people by 1908. This community's industrial lifeblood was its fishing and oyster business. A dredged approach to the town would enable it to enlarge this economic enterprise by permitting the use of schooners large enough to be seaworthy for red snapper fishing in the deep waters of the Gulf.[32]

A channel 7 feet deep by 80 feet wide was authorized and dredged in the year 1910, under a $10,000 appropriation. Mainly, the work consisted of excavation at Sand Point Reef, a shoal 18 miles above the pass between Matagorda and Lavaca bays, and at Gallinipper Reef, about 4 miles above Sand Point. The 26-mile-long Pass Cavallo-Port Lavaca Channel ran along the western shores of the two bays. Further improvement was not forthcoming until authorization in 1935 for an extension from this channel to the shoreline at the mouth of Lynn Bayou, where local interests proposed construction of a turning basin, terminal facilities, seafood packing plant, and protected harbor. The Pass Cavallo-Port Lavaca Channel was enlarged to 9-by-100-foot dimensions in 1939.[33]

The feasibility of a channel extending beyond Port Lavaca up Lavaca Bay, the Lavaca River, and the Navidad River which joins it had first been explored in 1913, but was not considered favorably at that time. By 1939, oil had been discovered in the vicinity; commerce along this route included materials for the oil fields, building supplies, mudshell dredged from Lavaca Bay that was used for constructing roads in the oil fields and in the county, and, of course, the agricultural products of the region. Above the confluence of the two rivers, the Navidad continued wide and unobstructed for almost 3 miles up to Red Bluff. This point was selected as the head of navigation for a 6-by-100-foot channel, extending 20 miles into the interior from its junction with the Pass Cavallo-Port Lavaca Channel which linked it to the growing intracoastal waterway. The channel to Red Bluff was authorized in 1945 and completed in 1957; a 9-foot-deep approach channel and harbor of refuge below Port Lavaca, authorized at the same time, were completed during 1959-60.[34]

After abandonment of the jetty project at Pass Cavallo in 1888, no improvement had been attempted between the Gulf and Matagorda Bay. For many years, Pass Cavallo served in its natural state to accommodate



Port Lavaca Field Office

the shallow-draft vessels using its channel. The pass had remained in a stable position for more than two hundred years and the channel depth between the inner and outer bars ranged from 20 to 42 feet. Opening of the Colorado River flood discharge channel across Matagorda Peninsula in the mid-1930s reduced the tidal flow through Pass Cavallo and, gradually, its navigability.

By 1949, the outer bar posed a drastic problem, even for the small fishing and oil exploration vessels that needed to cross it; navigation required calm weather and was limited to boats drawing less than 6 feet. As an emergency measure to relieve this restricted situation, the Corps of Engineers cut a 3,000-foot-long channel, 17 by 135 feet. Completed by September 9, 1949, this channel shoaled rapidly to a depth of 10 feet within two months; by March of 1952, it had deteriorated to a mere 8 feet.[35]

The need for a safe, dependably navigable channel from the Gulf of Mexico into Matagorda Bay had become apparent. At a public hearing at Port Lavaca on January 12, 1949, local interests sought a shallow-draft channel to provide passage for commercial vessels engaged in fishing and in oil-related activities in the Gulf and for pleasure boats. On April 27, interests on the eastern shore of the bay attended a hearing at Matagorda and expressed similar needs, although they preferred a Gulf outlet along the route of the Colorado River.[36]

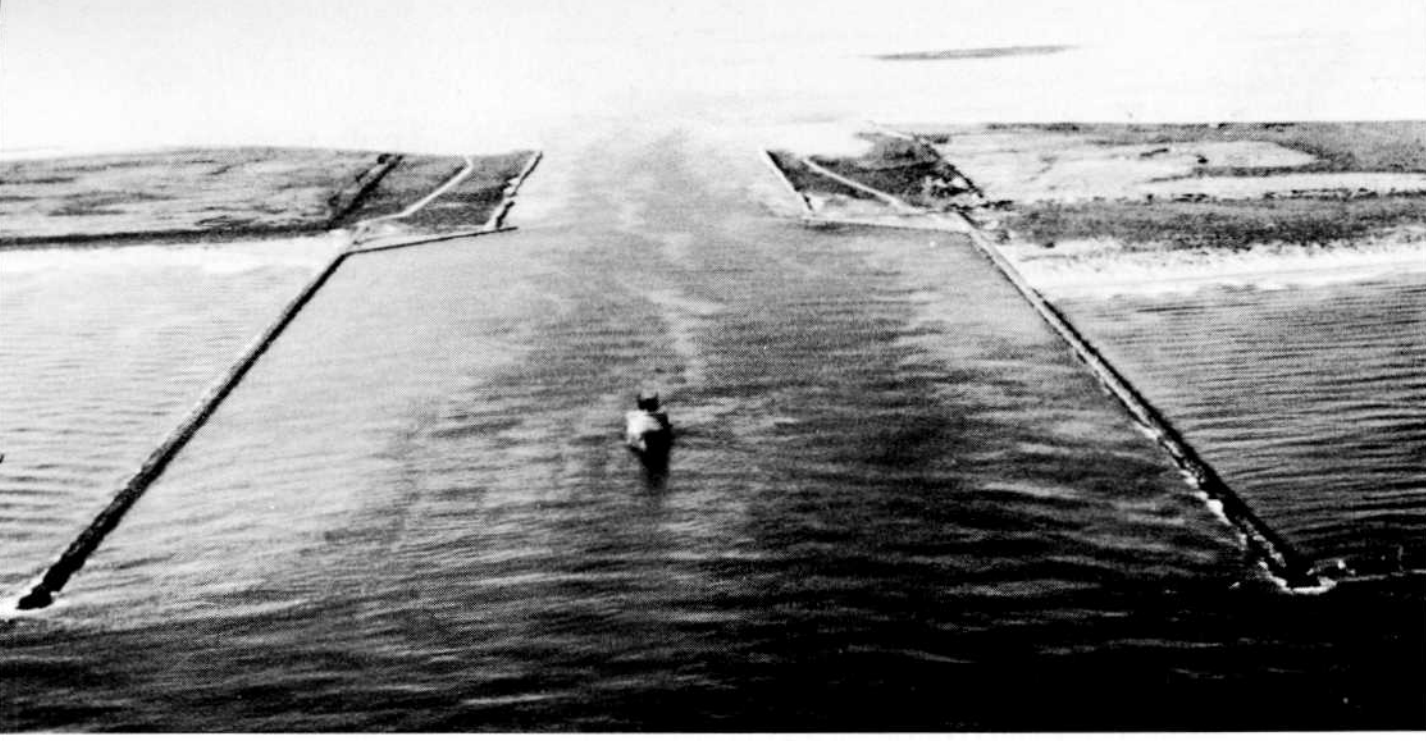
Late in May, 1955, the desirability of a deep-draft channel arose; this was requested by the Calhoun County Navigation District at a hearing in Palacios on August 2. The proposed channel would terminate at a turning basin at Point Comfort, where the Aluminum Corporation of America had constructed an aluminum smelting plant to which it had dredged a 9-by-100-foot channel from the Pass Cavallo-Port Lavaca Channel in 1949.

Alcoa's plans to erect two alumina reduction plants entailed importing 1,080,000 tons of bauxite ore annually from Surinam, South America and from the Dominican Republic. At that time, ore was being brought in through Aransas Pass, transferred to barges, and transported approximately 75 miles along the intracoastal waterway — a cumbersome and expensive operation. A deep-draft channel would permit new ore carriers, with loaded drafts of 34 feet, to bring the bauxite directly to Point Comfort. In requesting deep-draft improvements, the company entered into a franchise agreement with the Calhoun County Navigation District for certain areas and services, including a public dock. The turning basin at Point Comfort was to be designated the Calhoun County Turning Basin, served by the public dock on which Alcoa proposed to furnish $4 million worth of handling facilities and rail connections.[37]

In 1958, Congress authorized the first deep-draft project for Matagorda Bay.[38] Called the Matagorda Ship Channel, the project extended from the Gulf to Point Comfort and included a 4-mile-long, 38-by-300-foot outer bar and jetty channel, a 22-mile-long, 36-by-200 foot inner channel (incorporating the existing Pass Cavallo-Port Lavaca Channel), a 1,000-foot-square turning basin at Point Comfort, and dual jetties to protect the entrance channel from wave action and shoaling. The act also provided for enlargement of the shallow-draft channels near Port Lavaca.

Between 1959 and 1962, the U.S. Army Engineer Waterways Experiment Station at Vicksburg constructed a model and conducted investigations primarily to determine the best location for the entrance channel and the type of protective works that would be needed to secure and maintain the channel. Three entrance plans were studied: one through Pass Cavallo and two involving cuts across Matagorda Peninsula, northeast of the natural pass. The location selected lay about 5 miles from the pass and afforded the shortest and straightest route. It further involved less extensive jetties than would be needed at Pass Cavallo, with correspondingly lower construction and maintenance expenses.[39]

During the course of construction, one "happenstance" caused a deviation from the original timetable. Contractors were scheduled to begin dredging the cut across the peninsula on the bay side and work toward the Gulf; they were not to complete the cut, however, until the work on the jetties was finished. They dredged as far as they could and then stopped, awaiting completion of the jetties. Once again, the erratic weather of the Gulf Coast intervened. A severe storm blew in; when it blew out, a prematurely completed cut lay in its wake. Consequently, the final stages of jetty construction were attended by some uninvited difficulties, but these complications were eventually overcome and the deep-draft Matagorda Ship Channel was opened to traffic in 1966.[40]



U.S. hopper dredge McFarland *sails through Matagorda Ship Channel jetties.*

The Work Goes On

Since the army engineers first surveyed the Texas Coast in 1852, this region has grown into an important sector of the national economy. Raw materials moved along the intracoastal waterway feed into the many waterside plants and refineries that have sprung up along its banks. Major waterway users — petroleum, chemical, and non-metallic minerals companies — are joined by the host of other coastal industries that enjoy the economies of transportation by water. The channel improvements accomplished by the Galveston District have catalyzed transformation of this locale into a thriving industrial, residential, and recreational complex. Commerce along the waterways accounts for more than three-fourths of all goods shipped out of the state. In the year 1974, Texas ports handled cargoes exceeding 241 million tons.

Oldest responsibility of the Galveston District, coastal navigation has been continuously facilitated by the district since its establishment. The works described in this history reflect only the highlights of the district's accomplishments in this sphere of civil works. The scope of surveys undertaken and improvements made is far too extensive to allow for inclusive coverage. It would be doing the district an injustice, however, to fail to mention that many other navigation projects have been executed.

Despite boundary changes that have occurred, the Galveston District has retained its responsibility for navigation. In 1933, the district was relieved of responsibility for the Red River watershed, keeping within its

jurisdiction all other river and harbor improvements in Texas. Significantly affecting the Galveston District in other respects, creation of the Fort Worth District in 1950 left substantially intact Galveston's responsibility for coastal navigation.

Although the major thrust of new construction along the coast has largely subsided, the work goes on. A channel 40 feet deep offers no navigational advantage unless it can be relied upon to indeed be 40 feet deep. The district attends to the task of maintaining dependable project depths that enable ships to safely sail the channels within its boundaries. Further, it keeps the channels clear of obstructions and enlarges them to meet the demands of larger vessels being placed in service. Constant surveillance and rehabilitation are required for the protective jetties that receive endless abuse from the ravages of Gulf currents, tropical storms, and whatever other insults the elements and civilization may heap upon them. Finally, the district has protected its navigable waters from harmful alterations and detrimental refuse, exercising this regulatory function more vigorously in recent years.

The Galveston District has been said to have more boats in operation along its coast than does the Coast Guard.[41] In all, 260 miles of deep-draft and 720 miles of shallow-draft channels comprise the "housekeeping" work of the district — unglamorous, perhaps, but nevertheless essential to securing the Texas Coast for the purposes of navigation.

Notes to Chapter 6

[1] Act of March 3, 1826, *Laws of the United States Relating to the Improvement of Rivers and Harbors from August 11, 1790 to June 29, 1938* (Washington, D.C.: Government Printing Office, 1940), 1: 30-31; As early as 1818, George Graham, and American emissary sent to Texas, envisioned the navigational potential of a coastal canal behind the chain of islands running southwest of Galveston. Marilyn McAdams Sibley, *The Port of Houston* (Austin and London: University of Texas Press, 1968), pp. 13-15.

[2] Rivers and Harbors Act of March 3, 1873, ch. 233, 17 Stat. 560.

[3] *Annual Report of the Chief of Engineers to the Secretary of War for the Year 1875* (Washington, D.C.: Government Printing Office, 1875), pp. 876, 896 (hereafter cited as *ARCE*, followed by date of fiscal year covered in report).

[4] *Ibid.*, p. 876.

[5] *Ibid.*, pp. 898-99.

[6] *Ibid.*, p. 877.

[7] Rivers and Harbors Act of July 13, 1892, ch. 158, 27 Stat. 88; *ARCE, 1896*, p. 1544.

[8] *ARCE, 1888*, p. 1298; *ARCE, 1897*, p. 1810; *ARCE, 1900*, p. 2422; Rivers and Harbors Act of June 13, 1902, ch. 1079, 32 Stat. 331.

[9] H.R. Doc. 640, 59th Cong., 2d sess. (1907), p. 49.

[10] Tom Lea, *The King Ranch* (Boston: Little, Brown & Co., 1957), p. 548.

[11] Rivers and Harbors Act of March 3, 1905, ch. 1482, 33 Stat. 1117; H.R. Doc. 640, 59th Cong., 2d sess. (1907), pp. 3-4.

[12] H.R. Doc. 640, 59th Cong., 2d sess. (1907), pp. 4-5, 23; Rivers and Harbors Act of March 2, 1907, ch. 2509, 34 Stat. 1073; *ARCE, 1909*, p. 1510; *ARCE, 1910*, pp. 549-50.

[13] William J. Hull and Robert W. Hull, *The Origin and Development of the Waterways Policy of the United States* (Washington, D.C.: National Waterways Conference, Inc., 1967), p. 31.

[14] H.R. Comm. Doc. 3, 61st Cong., 2d sess. (1908), p. 5.

[15] Rivers and Harbors Act of June 25, 1910, ch. 382, 36 Stat. 630; Rivers and Harbors Act of March 3, 1909, ch. 264, 35 Stat. 815.

[16] Hearings before Committee on Rivers and Harbors, House of Representatives, 77th Cong., 1st sess., on The Improvement of the Louisiana and Texas Intracoastal Waterway from Corpus Christi, Tex. to the Rio Grande, October 7, 1941, from testimony of C.S.E. Holland, p. 7; H.R. Doc. 238, 68th Cong., 1st sess. (1924), p. 98.

[17] H.R. Doc. 238, 68th Cong., 1st sess. (1924), pp. 2-6, 40-47; Rivers and Harbors Act of March 3, 1925, ch. 467, 43 Stat. 1186; Rivers and Harbors Act of January 21, 1927, ch. 47, 44 Stat. 1010.

[18] H.R. Doc. 238, 68th Cong., 1st sess. (1924), p. 45.

[19] *ARCE, 1942*, p. 865.

[20] H.R. Doc. 230, 76th Cong., 1st sess. (1939), p. 14.

[21] *Review of Reports on the Gulf Intracoastal Waterway at the Brazos River and the Colorado River Crossings, Texas* (Unsubmitted report, Corps of Engineers, Galveston District, October 1949), p. 29 (hereafter cited as *Review of Reports*); *ARCE, 1944*, p. 762; *ARCE, 1945*, p. 1029.

[22] H.R. Doc. 642, 75th Cong., 3d sess. (1938), pp. 7-8; S. Doc. 102, 90th Cong., 2d sess. (1968), p. 26; H.R. Doc. 388, 84th Cong., 2d sess. (1956), p. 18; *Review of Reports*, pp. 7, 30; *ARCE, 1957*, p. 701.

[23] Act of July 23, 1942, ch. 520, 56 Stat. 703.

[24] Interview with William C. Rettiger, 25 February 1975.

[25] Interview with Thomas Forman, 12 June 1974.

[26] *ARCE, 1952*, p. 919; S. Doc. 11, 86th Cong., 1st sess. (1959), pp. 3-4, 12-13; Act of September 9, 1959, Pub. L. No. 86-248, §4, 73 Stat. 478; *ARCE, 1962*, p. 751.

[27] Joseph P. Breuer, "An Ecological Survey of the Lower Laguna Madre of Texas, 1953-1959," *Publications of the Institute of Marine Science* 8 (1962): 162, 180. Breuer also notes on p. 179, "Since the dredging of the Intracoastal Canal in 1948, fish kills due to hypersalinity have not occurred."

[28] H.R. Doc. 238, 68th Cong., 1st sess. (1924), p. 102; Recent legislation introduced by State Sen. A. R. Schwartz of Galveston and Rep. Pike Powers of Beaumont resulted in the Texas Coastal Waterway Act of 1975. Effective 1 September 1975, this law authorized the state to serve as local sponsor for the main channel of the waterway by acquiring easements and rights-of-way for deposit of dredged material and for channel expansion, relocation, or alteration in areas not incorporated by port and navigation districts. TEX. REV. CIV. STAT. ANN. art. 5415e-2, §1-7 (Supp. 1975).

[29] S. Ex. Doc. 1, 33d Cong., 1st sess. (1853-54), 2: 562.

[30] *ARCE, 1888*, p. 1305.

[31] *Ibid.*

[32] H.R. Doc. 1082, 60th Cong., 2d sess. (1908), pp. 3-6.

[33] Rivers and Harbors Act of June 25, 1910, ch. 382, 36 Stat. 630; *ARCE, 1911*, p. 1800; H.R. Comm. Doc. 28, 74th Cong., 1st sess. (1935), p. 2; Rivers and Harbors Act of August 30, 1935, ch. 831, 49 Stat. 1028; Rivers and Harbors Act of August 26, 1937, ch. 832, 50 Stat. 844; *ARCE, 1939*, pp. 953-54.

[34] H.R. Doc. 1667, 63d Cong., 3d sess. (1915), p. 2; H.R. Doc. 314, 76th Cong., 1st sess. (1939), pp. 2, 8-10; Rivers and Harbors Act of March 2, 1945, ch. 19, 59 Stat. 10; *ARCE, 1960*, p. 693; *ARCE, 1961*, p. 765.

[35] H.R. Doc. 388, 84th Cong., 2d sess. (1956), pp. 12, 18.

[36] *Ibid.*, p. 20.

[37] *Ibid.*, p. 19.

[38] Rivers and Harbors Act of July 3, 1958, Pub. L. No. 85-500, 72 Stat. 297.

[39] H. D. Simmons and H. J. Rhodes, *Matagorda Ship Channel Model Study, Matagorda Bay, Texas*, Technical Report no. 2-711 (Vicksburg: U.S. Army Engineers Waterway Experiment Station, 1966), p. 32.

[40] S. Doc. 99, 90th Cong., 2d sess. (1967), p. 65.

[41] *Galveston Daily News*, 3 July 1974.